

March 13, 2017

City of Rockville

Pension Plan

Plan year beginning July 1, 2017



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1. Executive Summary

Current Plan Year Costs (Fiscal Year 2018)

This report presents the results of our actuarial valuation of the City of Rockville Retirement Plan as of July 1, 2017, including the contribution required. Asset and census information was gathered as of July 1, 2016 and projected to July 1, 2017.

The projected Actuarially Determined Contribution (ADC) for the City of Rockville Retirement Plan for fiscal year 2018 (July 1, 2017 through June 30, 2018) is \$3,899,592. The ADC is in addition to employee contributions and represents a minimum deposit level equaling the employer share of the normal cost plus the amortization of the unfunded liabilities as of June 30, 2018.

Deposit Information for FY2017

A summary of the results of the actuarial valuation is as follows:

Total normal cost plus expense	\$2,176,206
Employee normal cost (expected employee contributions)	\$771,518
Employer normal cost	\$1,404,688
Total normal cost as a percentage of total member compensation	5.58%
ADC	\$3,899,592
ADC as a percentage of total member compensation	10.00%

Analysis

The ADC for the City of Rockville Defined Benefit Pension Plan increased in the 2017 plan year (fiscal 2018) to approximately \$3.9 million. The FY2017 ADC is \$0.4 million higher than the FY17 ADC due mainly to the net impact of the assumption changes. The actuarial value of assets was lower than expected due to the recognition of deferred losses from 2012, 2015, and 2016. (See page 10 for a full development of the actuarial value of assets.) Overall, the funded status of the plan is expected to decrease from 87.0% on July 1, 2016 to 81.8% on July 1, 2017.

Similar to plan reports in previous years, we have included a projection of the ADCs of the plan. This may be found beginning on page 6.

Changes from Prior Valuation

There were changes in assumptions or plan provisions since the last valuation. These assumptions were developed from an experience study from 2011 through 2015. The changes in assumptions include:

- Decrease in the Investment Return assumption from 7.50% to 7.00%
- Updated Salary Scale

- Updated Withdrawal Rates
- Updated Retirement Rates
- Updated Mortality Rates

Funding Method

The Entry-Age Normal Cost Method was used to determine liabilities and costs related to retirement, termination, disability and pre-retirement death benefits. The normal cost is calculated as a level annual funding cost from entry age to the expected decrement date.

The entry age normal cost method is used for this valuation. This method estimates the total cost of all projected plan benefits based on the assumptions shown in this report and the participant data supplied to us.

Costs are spread evenly from a member's date of hire to assumed retirement age. This annual cost is spread as a level percentage of compensation. The sum of each member's annual cost is the normal cost of the plan.

The value of calculated costs for past years is the actuarial accrued liability (AAL). Each year the unfunded actuarial liability (UAAL) is the AAL less the actuarial value of assets. A value less than zero represents a surplus.

The ADC is equal to the normal cost of the plan, plus amortization of the plan's UAAL. New amortizations are added each year to cover increases or decreases in the UAAL. These are amortized over new 20-year periods.

Supplemental Employee Contributions

If the City contribution to the defined benefit plan on behalf of Administrative, Union and Police employees exceeds 6.5% of the earnings of those employees, the City may, at its discretion, impose a "Supplemental Employee Contribution" for the following year.

The amount of the Supplemental Employee Contributions is limited to no more than 50% of the excess of the city contribution over 6.5% of the earnings of the Administrative, Union, and Police employees. See page 7 for the calculation of the Supplemental Employee Contribution.

2. Funding Calculations

Deposit Information

Normal Cost		
	Fiscal 2018 July 1, 2017	Fiscal 2017 July 1, 2016
Total normal cost	\$ 2,176,206	\$ 2,479,772
Employee normal cost (expected contributions from employees not yet eligible for normal retirement)	771,518	758,929
Employer normal cost	1,404,688	1,720,844
Total member compensation	39,007,476	37,035,445
Total normal cost as a percentage of member compensation	5.58%	6.70%
Actuarially Determined Contributions		
Employer normal cost	1,404,688	1,720,844
Amortization amount	2,239,790	1,510,091
Valuation interest to the end of the plan year	255,114	242,320
Actuarially Determined Contribution (ADC)	3,899,592	3,473,255
ADC as percentage of total member compensation	10.00%	9.38%

The ADC represents the employer contribution to the plan and is in addition to employee contributions. The member compensation includes expected salary growth during the fiscal year.

Development of Normal Cost

The normal cost is the portion of cost assigned to each year. Under the entry age normal cost method used in this valuation, each member's annual cost is calculated as described in the Assumptions and Methods section. The sum of the annual costs for all members plus an estimate of plan expenses to be paid from the fund is the total normal cost for each year.

a) Normal cost for Administrative Personnel and Union	\$ 1,647,780
b) Normal cost for Police	491,461
c) Estimated expenses	<u>36,965</u>
d) Total normal cost (a + b + c)	\$ 2,176,206

Unfunded Actuarial Accrued Liability

a) Unfunded actuarial liability (as of 7/01/2016)	\$21,864,496
b) Changes made during the plan year	0
c) Employer normal cost (as of 7/01/2016)	1,720,844
d) Interest on the above items	<u>1,650,974</u>
e) Total (a + b + c + d)	25,236,314
f) Employer contributions	3,832,135
g) Interest on employer contribution	<u>134,125</u>
h) Total (f + g)	3,966,260
i) Expected unfunded actuarial accrued liability (as of 7/01/2017) (e - h)	21,270,054
j) Actuarial accrued liability	116,842,174
k) Actuarial value of assets projected to 7/01/2017	95,584,743
l) Projected unfunded actuarial accrued liability (as of 7/01/2017)	21,257,431
m) Actuarial (gain) or loss (actual less expected unfunded actuarial accrued liability) (l - i)	(\$12,622)

Schedule of Amortization Bases

The City's cost method allocates a portion of plan funding to be amortized in equal annual installments, in addition to the normal cost. The period over which the bases can be amortized is described in the laws and/or regulations.

Date Created	Item	Remaining Period (Years)	Outstanding Balance	Amortization Payment
7/01/2014	Initial Unfunded Actuarial Liability	15.25	\$ 17,100,007	\$ 1,859,756
7/01/2015	2013/2014 Actuarial Gain	17	\$ (3,943,307)	\$ (403,894)
7/01/2016	2014/2015 Actuarial Loss	18	\$ 59,389	\$ 5,904
7/01/2017	2015/2016 Actuarial Loss	19	\$8,041,342	\$ 778,024
Total	Unfunded Actuarial Accrued Liability		\$ 21,257,431	\$ 2,239,790

Benefits Index Option

As of June 30, 2016, there was a group of 72 retirees and beneficiaries under the Benefits Index Option with Principal. The City of Rockville is required to maintain a minimum level of assets with Principal; otherwise these employees will be annuitized at current market costs. The benefits due to these retirees are paid from the Principal accounts.

If the Benefit Index Option retirees had been converted to annuities on June 30, 2016, the liability would increase from \$7.58 million to \$10.01 million. The increase is mainly due to the low interest rate environment in the annuity market.

Principal requires that the funds exceed the annuitized value of the retiree benefits. They determine the amount needed to cover the Benefits Index retirees through a two-step formula. First, they increase the annuitized liability by 10% as part of a threshold test. Next they take into consideration the volatility of the assets classes and come up with a weighted volatility factor that is used to increase the amount of funds needed to cover the retiree payments.

On June 30, 2016, the funds with Principal were invested in the following manner and with the following assumed volatility factors:

<u>Principal Fund Name</u>	<u>Balance</u>	<u>Volatility Factor</u>
Money Market	\$80,890	0.95
Inflation Protection	\$6,804,252	0.95
Bond and Mortgage	\$7,831,198	0.95
Large Cap S&P 500 Index	\$15,606,192	0.75
Diversified Intl	\$16,931,188	0.60
Total	\$47,253,720	0.7585

The weighted average volatility factor is divided into the increased annuitized liability to derive the Benefit Index as of a particular date. As of June 30, 2016, the Benefits Index equaled approximately \$14.5 million (i.e., \$10.01 x 1.1 / 0.7585). With almost \$47.3 million invested with Principal, the Benefit Index is easily covered.

It is important to note that the volatility factors have a significant impact on the high level of assets required to be held by Principal. If all of the Principal funds were invested in the Bond fund, or the inflation Protection fund, which have the least volatility, then the Benefit Index would decrease from \$14.5 million required to \$11.6 million required.

3. Funding Projections

Actuarially Determined Contribution Projections

As part of the actuarial valuation, we have projected contribution estimates for 5 years into the future based on the current year results. These estimates utilize the same assumptions and census data as of 7/01/2016. Additionally, asset returns are assumed to be 7.00% for all future years.

Any deviation in assumption, census demographics, or asset performance would impact these approximations.

	FY 2018 July 1, 2017	FY 2019 (\$ in millions)	FY 2020 (\$ in millions)	FY 2021 (\$ in millions)	FY 2022 (\$ in millions)	FY 2023 (\$ in millions)
Interest Rate	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
Return on Market Assets		7.00%	7.00%	7.00%	7.00%	7.00%
Actuarial Accrued Liability	\$116,842,174	121.38	125.89	130.35	134.72	139.09
Actuarial Value of Assets	95,584,743	100.79	104.79	109.58	115.31	121.15
Unfunded Liability	21,257,431	20.59	21.11	20.77	19.42	17.93
Funded Ratio	81.8%	83.0%	83.2%	84.1%	85.6%	87.1%
Amortization of Unfunded	\$2,239,790	2.27	2.42	2.50	2.50	2.50
Employer Normal Cost	1,404,688	1.46	1.52	1.58	1.64	1.71
Interest	255,113	0.26	0.28	0.29	0.29	0.29
ADC	\$3,899,591	3.99	4.21	4.36	4.43	4.50

Supplemental Employee Contribution Projections

As documented in the provisions of the plan, the City of Rockville maintains the right to enforce a Supplemental Employee Contribution as it pertains to the defined benefit portion of the pension plan. Specifically, as of any July 1, if the City contribution to the Defined Benefit Option of the plan made on behalf of employees exceeds 6.50% of the earnings of the employees, then the City reserves the right to impose a Supplemental Employee Contribution for the following fiscal year.

This Supplemental Employee Contribution can be no more than 50% of the excess of the City contribution over 6.50% of earnings for employees. Such a contribution would be treated as a contribution to the Defined Benefit Option. The following table represents the calculation of the current Supplement Employee Contribution plus 5 projection years.

Administrative and Union Employees

	FY 2018 July 1, 2017	FY 2019 (\$ in millions)	FY 2020 (\$ in millions)	FY 2021 (\$ in millions)	FY 2022 (\$ in millions)	FY 2023 (\$ in millions)
Admin compensation	\$28,805,990	29.96	31.16	32.40	33.70	35.05
Union compensation	5,048,748	5.25	5.46	5.68	5.91	6.14
Total compensation	33,854,738	35.21	36.62	38.08	39.61	41.19
Total ADC	\$3,899,591	3.99	4.21	4.36	4.43	4.50
Admin and Union ADC	3,713,698	3.80	4.01	4.16	4.22	4.29
ADC as a % of compensation	10.97%	10.79%	10.95%	10.92%	10.66%	10.42%
Excess over 6.5%	4.47%	4.29%	4.45%	4.42%	4.16%	3.92%
50% of excess	2.23%	2.15%	2.23%	2.21%	2.08%	1.96%
Maximum Supplemental Employee Contribution	\$754,961	0.76	0.82	0.84	0.82	0.81

Police Employees

	FY 2018 July 1, 2017	FY 2019 (\$ in millions)	FY 2020 (\$ in millions)	FY 2021 (\$ in millions)	FY 2022 (\$ in millions)	FY 2023 (\$ in millions)
Police compensation	\$5,152,735	5.36	5.57	5.80	6.03	6.27
Total ADC	\$3,899,591	3.99	4.21	4.36	4.43	4.50
Police ADC	185,893	0.19	0.20	0.20	0.21	0.21
ADC as a % of compensation	3.61%	3.52%	3.59%	3.51%	3.50%	3.37%
Excess over 6.5%	-2.89%	-2.98%	-2.91%	-2.99%	-3.00%	-3.13%
50% of excess	-1.45%	-1.49%	-1.45%	-1.50%	-1.50%	-1.56%
Maximum Supplemental Employee Contribution	\$0	0.00	0.00	0.00	0.00	0.00

Employer Thrift Plan Matching Contributions Projections

For both Union and Administrative Personnel enrolled in the Thrift Plan, employees can contribute 1%, 2%, 3%, 4%, or 5% of earnings to the Thrift Plan. For each \$1.00 contributed by a member, the City of Rockville contributes \$0.50 to the plan.

While this valuation only reflects the Defined Benefit Plan portion of liabilities, we are able to estimate the cash outlay of the City's matching contribution to the Thrift Plan based on current census data, pay information, salary scale assumptions, and employee contribution percentages.

	Fiscal 2018 July 1, 2017	Fiscal 2019 July 1, 2018	Fiscal 2020 July 1, 2019	Fiscal 2021 July 1, 2020	Fiscal 2022 July 1, 2021
Total Thrift Plan Pay Only	\$32,440,000	\$33,740,000	\$35,090,000	\$36,490,000	\$37,950,000
Employee Contribution to Thrift Plan	1,508,000	1,578,000	1,650,000	1,724,000	1,802,000
City Matching Contribution to Thrift Plan	754,000	789,000	825,000	862,000	901,000

Allocation of 2017 Plan Year Contribution (Fiscal 2018)

	Admin and Union	Police	Total
2017 Employer Normal Cost	\$1,337,727	\$66,961	\$1,404,688
Allocation percentage	95.23%	4.77%	100.00%
Allocated Actuarially Determined Contribution	\$3,713,698	\$185,893	\$3,899,591
Total annual member compensation	\$33,854,738	\$5,152,735	\$39,007,473
Allocated ADC as a percentage of compensation	10.97%	3.61%	10.00%
Discretionary Supplemental Contribution for next year	\$754,961	\$0	\$754,961

4. Asset Information

Plan Assets are measured at the beginning of each plan year. Both the projected market value and actuarial value for the 2016 plan year are shown below. Actuarial value of assets is used for all funding calculations. The derivation of the Actuarial Value of assets is on the following page and identifies the reason for any difference between Market Value and Actuarial Value in the Methods Selected by Plan Sponsor section of Assumptions and Methods.

The actuarial value of plan assets as of June 30, 2016 is **\$90,416,008**. The market value of assets as of June 30, 2016 is \$87,410,036. The following table shows the amount of funds invested in each account as of June 30, 2016:

City of Rockville Market Value of Assets as of June 30, 2016	
Accounts	Balance
<u>Principal</u>	
Money Market	\$80,890
Inflation Protection	\$6,804,251
Bond and Mtg	\$7,586,144
Large Cap S&P 500 Index	\$15,036,189
Diversified Intl	<u>\$16,931,188</u>
Total – Principal	\$46,438,662
<u>Prudential & Other</u>	
Invesco - Equities	\$10,012,371
PRISA - Real Estate	\$12,141,008
Black Rock	\$8,709,087
GE - Equities	\$9,707,847
Prudential - Money Market	<u>\$401,061</u>
Total – Non Principal	\$40,971,374
Total – All Accounts	\$87,410,036

The actuarial value of assets smooths investment gains and losses over five years at 20 percent per year. The asset valuation method changed five years ago and is not fully phased in. For this purpose, a gain or loss is the difference between the actual return and the expected long-term investment return (currently 7.00 percent). Any future gains or losses are also recognized over five years. After the method is in place in its fifth year, the asset value recognizes 20 percent of the current year's gain or loss and 20 percent of each of the prior four years of gains and losses. By combining five years of gains and losses, the asset fluctuations are dampened from experiencing drastic upward and downward swings in value. 80% of the 2016 losses, 60% of the 2015 losses, 40% of the 2014 gains, and 15% of the 2013 gains are deferred to future years. A full development of this value can be found on the following page.

Development of Actuarial Value of Assets

(1)	Actuarial value of assets as of 7/01/15	\$ 85,929,105
(2)	Contributions	
(a)	Employee contributions	\$ 743,813
(b)	Employer receivable (from prior year)	-
(c)	Employer contributions	\$ 3,575,462
(3)	Benefit payments & expenses	\$ 5,196,708
(4)	Interest on (1), (2a), (2b), (2c) and (3) at 7.00%	\$ 5,984,327
(5)	Expected actuarial value of assets as of 7/01/16	\$ 91,036,000
(6)	Market value of assets as of 7/01/16	\$ 87,410,036
(7)	Development of amount of difference to be amortized	
(a)	Unrecognized amount from 4/01/12 15% x 2012 Total (see chart below)	(\$352,118)
(b)	Unrecognized amount from 4/01/13 35% x 2013 Total (see chart below)	28,175
(c)	Unrecognized amount from 7/01/14 60% x 2014 Total (see chart below)	3,881,792
(d)	Unrecognized amount from 7/01/15 80% x 2015 Total (see chart below)	<u>(2,822,854)</u>
(e)	Difference between expected actuarial value and market value 7/01/16 (6) – (5) – (7a) – (7b) – (7c) – (7d)	\$ (4,360,959)
(8)	Unrecognized market value 7/01/16 (see chart below)	\$ (3,005,972)
(9)	Actuarial Value of assets 7/01/16 (6) – (8)	\$ 90,416,008
(10)	Employer contributions receivable after 7/01/16	0
(11)	Adjusted Actuarial value of assets as of 7/01/16 (9) + (10)	\$ 90,416,008

Allocation of Deferred Gains and (Losses)

Allocation Year	Plan Year				
	2012	2013	2014	2015	2016
2011	\$(469,490)				
2012	(586,864)	\$20,125			
2013	(469,491)	16,100	\$1,293,931		
2014	(469,491)	16,100	\$1,293,931	\$(705,713)	
2015	(352,118)	16,100	\$1,293,931	\$(705,713)	\$(872,192)
2016		12,075	\$1,293,931	\$(705,713)	\$(872,192)
2017			\$1,293,930	\$(705,714)	\$(872,192)
2018				\$(705,714)	\$(872,192)
2019					\$(872,191)
Total	\$ (2,347,454)	\$ 80,500	\$ 6,469,654	\$ (3,528,567)	\$ (4,360,959)
Deferred	\$ 0	\$ 12,075	\$ 2,587,861	\$ (2,117,141)	\$ (3,488,767)
Unrecognized Market Value (sum of Deferred row above)					\$ (3,005,972)

Historical Investment Returns

The following table represents the investment returns by calendar year since January 1, 2006. Also presented are the compounded returns for the last 1 through 10 years.

<i>Calendar Year Ended</i>	<i>Approximate Rate of Return Market Value</i>	<i>Level Compounded Annual Return Over Last “n” Years</i>	
		<i>“n”</i>	<i>Market Value</i>
December 31, 2015	1.0%	1	1.0%
December 31, 2014	6.1%	2	3.5%
December 31, 2013	14.6%	3	7.1%
December 31, 2012	13.1%	4	8.6%
December 31, 2011	0.2%	5	6.8%
December 31, 2010	16.0%	6	8.3%
December 31, 2009	17.0%	7	9.5%
December 31, 2008	-32.5%	8	3.1%
December 31, 2007	6.5%	9	3.5%
December 31, 2006	13.7%	10	4.4%

5. Data and Assumptions

Census Data

	7/01/2015	7/01/2016	Change
Number of Covered Participants			
Actives	489	507	+18
Terminated Vested	52	50	-2
Retirees	234	241	+7
Beneficiaries	11	16	+5
Total	786	814	+28
Average Age			
Actives	45.8	46.1	+0.3
Terminated Vested	51.4	51.9	+0.5
Retirees	69.9	70.2	+0.3
Average Years of Service			
Actives	11.4	11.3	-0.1
Total Monthly Accrued Benefits			
Terminated Vested	\$44,571	\$43,590	-2.2%
Retirees	358,543	369,898	+3.2%

Census Reconciliation

	Police	Admin DB	Admin TP	Union DB	Union TP	Total
Active Participants						
Count on 7/01/2015	56	19	319	0	95	489
New entrants	+2		+33		+16	+51
Plan to plan transfer			-2		+2	0
Terminated, non-vested			-18		-7	-25
Terminated, vested			-2			-2
Retired with annuity		-4	-1		-1	-6
Death						0
Count on 7/01/2016	58	15	329	0	105	507
Inactive Participants*						
Count on 7/01/2015	2	3	33	0	14	52
Return to active status						0
Retired with annuity			-3		-1	-4
Terminated, lump sum						0
Terminated, vested			+5		+1	+6
Death			-2		-2	-4
Count on 7/01/2016	2	3	32	0	13	50
Retired Participants						
Count on 7/01/2015	9	101	103	16	16	245
New retired/beneficiary	+1	+4	+5		+3	+13
Death/Fixed Period Ends				-1		-1
Count on 7/01/2016	10	105	108	15	19	257

* There are 33 terminated non-vested employees with positive account balances as of July 1, 2016 that have been excluded from the inactive counts. This has been done to reduce the upward and downward swings caused by this part of the population. The sum of their expected refunds of contributions have been added to the liability.

Profiles of Active Population

Distribution of the Active Population by Age and Service Groups as of July 1, 2016

Administrative Defined Benefit Actives

Age Range	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-24	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	2	2
55-59	0	0	0	0	0	0	6	6
60-64	0	0	0	0	0	0	5	5
65+	0	0	0	0	0	0	2	2
Total	0	0	0	0	0	0	15	15

Average Age: 59.3

Average Years of Service: 34.3

Administrative Thrift Actives

Age Range	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-24	5	0	0	0	0	0	0	5
25-29	17	2	0	0	0	0	0	19
30-34	21	14	4	1	0	0	0	40
35-39	13	13	9	3	1	0	0	39
40-44	14	10	3	5	2	0	1	35
45-49	10	13	11	7	6	0	0	47
50-54	11	12	9	12	6	14	0	64
55-59	10	4	6	8	6	10	3	47
60-64	5	2	3	6	5	3	0	24
65+	2	0	2	4	0	1	0	9
Total	108	70	47	46	26	28	4	329

Average Age: 46.5

Average Years of Service: 10.5

Union Thrift Actives

Age Range	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-24	2	1	0	0	0	0	0	3
25-29	8	0	0	0	0	0	0	8
30-34	9	2	2	0	0	0	0	13
35-39	11	2	2	1	0	0	0	16
40-44	3	2	3	1	0	0	0	9
45-49	4	2	2	4	0	0	0	12
50-54	3	5	4	4	1	5	0	22
55-59	2	1	6	4	0	5	0	18
60-64	0	1	1	0	1	0	0	3
65+	0	0	0	1	0	0	0	1
Total	42	16	20	15	2	10	0	105

Average Age: 45.0

Average Years of Service: 9.3

Police Actives

Age Range	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-24	1	0	0	0	0	0	0	1
25-29	5	0	0	0	0	0	0	5
30-34	4	4	2	0	0	0	0	10
35-39	2	2	3	0	0	0	0	7
40-44	2	4	2	3	4	0	0	15
45-49	0	1	3	0	3	0	0	7
50-54	0	0	0	1	1	4	1	7
55-59	0	0	1	0	0	1	3	5
60-64	0	0	0	0	0	0	1	1
65+	0	0	0	0	0	0	0	0
Total	14	11	11	4	8	5	5	58

Average Age: 41.8

Average Years of Service: 13.4

Distribution of the Active Population by Age and Service Groups

Age Range	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
0-24	8	1	0	0	0	0	0	9
25-29	30	2	0	0	0	0	0	32
30-34	34	20	8	1	0	0	0	63
35-39	26	17	14	4	1	0	0	62
40-44	19	16	8	9	6	0	1	59
45-49	14	16	16	11	9	0	0	66
50-54	14	17	13	17	8	23	3	95
55-59	12	5	13	12	6	16	12	76
60-64	5	3	4	6	6	3	6	33
65+	2	0	2	5	0	1	2	12
Total	164	97	78	65	36	43	24	507

Average Age: 46.1 Average Years of Service: 11.3

Profiles of Inactive Population

Distribution of Male Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	3	21,225	63,676
55 – 59	9	24,705	222,346
60 – 64	25	22,708	567,702
65 – 69	37	24,935	922,578
70 – 74	24	23,458	562,996
75 – 79	22	19,231	423,087
80 – 84	12	13,483	161,799
85 +	<u>7</u>	<u>19,073</u>	<u>133,511</u>
TOTAL	139	21,998	3,057,695

Average Age: 69.9

Average Pension: \$21,998

Distribution of Female Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	5	8,588	42,938
55 – 59	12	13,947	167,367
60 – 64	17	18,727	318,356
65 – 69	23	14,139	325,200
70 – 74	24	12,532	300,774
75 – 79	6	11,297	67,780
80 – 84	18	10,831	194,959
85 +	<u>13</u>	<u>9,229</u>	<u>119,981</u>
TOTAL	118	13,028	1,537,355

Average Age: 70.9

Average Pension: \$13,028

Distribution of All Administrative Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	5	7,117	35,585
55 – 59	18	18,286	329,147
60 – 64	29	21,918	635,618
65 – 69	51	22,349	1,139,780
70 – 74	42	19,274	809,527
75 – 79	24	18,399	441,567
80 – 84	26	12,363	321,429
85 +	<u>18</u>	<u>12,504</u>	<u>225,078</u>
	213	18,487	3,937,731

Average Age: 70.9

Average Pension: \$18,487

Distribution of All Union Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	1	3,690	3,690
55 – 59	2	4,248	8,495
60 – 64	8	7,966	63,727
65 – 69	8	9,619	76,954
70 – 74	6	9,041	54,243
75 – 79	3	9,161	27,483
80 – 84	4	8,832	35,329
85 +	<u>2</u>	<u>14,207</u>	<u>28,414</u>
	34	8,775	298,335

Average Age: 69.5

Average Pension: \$8,775

Distribution of Police Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	2	33,670	67,339
55 – 59	1	52,071	52,071
60 – 64	5	37,343	186,713
65 – 69	1	31,044	31,044
70 – 74	0	0	0
75 – 79	1	21,817	21,817
80 – 84	0	0	0
85 +	<u>0</u>	<u>0</u>	<u>0</u>
	10	35,898	358,984
Average Age: 60.9			
Average Pension: \$35,898			

Distribution of All Retirees and Beneficiaries

<i>Age as of July 1, 2016</i>	<i>Number</i>	<i>Average Annual Pension</i>	<i>Total Annual Pension</i>
< 55	8	13,327	106,614
55 – 59	21	18,558	389,713
60 – 64	42	21,097	886,058
65 – 69	60	20,796	1,247,778
70 – 74	48	17,995	863,770
75 – 79	28	17,531	490,867
80 – 84	30	11,892	356,758
85 +	<u>20</u>	<u>12,675</u>	<u>253,492</u>
	257	17,880	4,595,050
Average Age: 70.4			
Average Pension: \$17,880			

Plan Provisions

This report reflects the maximum benefit limits under Internal Revenue Code (IRC) Section 415 and maximum compensation limits under IRC Section 401 in effect on the first day of each plan year.

The following is a summary of plan provisions and does not alter the intent or meanings of the provisions contained in the contract or plan document. This report reflects the provisions of the plan effective through July 1, 2016.

Plan Eligibility		
	Defined Benefit Option	Thrift Plan Option
Administrative Personnel	Hired prior to 4/15/1986 and elected not to transfer to Thrift Plan	Hired prior to 4/15/1986 and elected to transfer from Defined Benefit Option or hired on or after 4/15/1986
Union Employees	Hired prior to 12/02/1986 and elected not to transfer to Thrift Plan	Hired prior to 12/02/1986 and elected to transfer from Defined Benefit Option or hired on or after 12/02/1986
Police Employees	All Police employees are eligible for the Defined Benefit Option only	N/A

Normal Retirement Benefit		
Form	All employees will receive a monthly annuity guaranteed for ten years and life thereafter. Optional forms may be elected in advance of retirement	
Age	Defined Benefit Option	Thrift Plan Option
Administrative Personnel and Union Employees	Attained at age 60	<u>Hired prior to July 1, 2011:</u> Attained at age 60 <u>Hired on or after July 1, 2011:</u> Attained age 65 and 10 years of credited service
Police	Earlier of attained age 60 or 25 years of service	N/A

Normal Retirement Benefit		
Amount (accrued benefit)	Defined Benefit Option	Thrift Plan Option
Union Employees	1.8% of average earnings times credited service	<p>The sum of (i), (ii), and (iii)</p> <ul style="list-style-type: none"> i. 1.8% of average earnings times credited service prior to 1/01/1987 ii. 1.0% of average earnings times credited service after 12/31/1986 iii. Actuarial equivalent of a lump sum payment of members Thrift Plan Option vested account balance. Member may elect a cash distribution or combination of cash and annuity
Administrative Personnel	<p>The sum of (i) and (ii)</p> <ul style="list-style-type: none"> i. 1.8% of average earnings times credited service prior to 4/01/1996 ii. 2.0% of average earnings times credited service on or after 4/01/1996 	<p>The sum of (i), (ii), and (iii)</p> <ul style="list-style-type: none"> i. 1.8% of average earnings times credited service prior to 4/01/1986 ii. 1.0% of average earnings times credited service after 4/01/1986 and prior to 4/01/1996 iii. 1.2% of average earnings times credited service on or after 4/01/1996 iv. Actuarial equivalent of a lump sum payment of members Thrift Plan Option vested account balance. Member may elect a cash distribution or combination of cash and annuity

Normal Retirement Benefit		
Amount (accrued benefit)	Defined Benefit Option	Thrift Plan Option
Police Employees	<p>The lesser of (i) and (ii):</p> <ul style="list-style-type: none"> i. 2.0% of average earnings times credited service up to 4/01/2004, plus 2.25% of average earnings times credited service on or after 4/01/2004 ii. 67.5% of average earnings 	

Early Retirement Benefit	
Age	<u>Hired prior to July 1, 2011:</u> Attained age 50 <u>Hired on or after July 1, 2011:</u> Attained age 58
Service	Ten years of credited service
Form	Same as normal retirement benefit
Amount	Accrued benefit on early retirement date reduced to reflect that payments begin prior to normal retirement date
Reduction Factors:	
Administrative Personnel and Union Employees	<u>Hired prior to July 1, 2011:</u> 1/4 of 1% for each month the benefit commences prior to normal retirement date. <u>Hired on or after July 1, 2011:</u> 3/8 of 1% for each month the benefit commences prior to normal retirement date.
Police	6/10 of 1% for each month during the first sixty months and 3/10 of 1% for each month during the next sixty months the benefit commences prior to normal retirement date

Late Retirement Benefit	
Age	No maximum age
Form	Same as normal retirement benefit
Amount	Accrued benefit on late retirement date

Deferred Vested Benefit	
Eligibility	Termination of employment after ten years of credited service
Form	Same as normal retirement benefit with income deferred until normal retirement date
Amount	Accrued benefit as date of termination In lieu of receiving a retirement benefit, an employee may elect to receive a lump sum payment equal to that which the employee would have received under the Termination Benefit below

Termination Benefit																		
	Defined Benefit Option	Thrift Plan Option																
Eligibility	Termination of employment prior to early or normal retirement date and before completing ten years of credited service	Termination of employment prior to early or normal retirement date and before completing seven years of credited service																
Form	Lump sum payment	Lump sum payment																
Amount	<div>The sum of (i) and (ii):<div><div>i. Employee contributions plus interest</div><div>ii. A portion of the City's contributions plus credited interest according to the following schedule:<table><tr><th>Years of Credited Service</th><th>Percent of City Share Earned</th></tr><tr><td>Less than 5</td><td>0%</td></tr><tr><td>5</td><td>50%</td></tr><tr><td>6</td><td>60%</td></tr><tr><td>7</td><td>70%</td></tr><tr><td>8</td><td>80%</td></tr><tr><td>9</td><td>90%</td></tr><tr><td>10 and over</td><td>100%</td></tr></table>City contributions are deemed to be 150% of the employee's contributions plus interest</div></div></div>	Years of Credited Service	Percent of City Share Earned	Less than 5	0%	5	50%	6	60%	7	70%	8	80%	9	90%	10 and over	100%	Vested account balance
Years of Credited Service	Percent of City Share Earned																	
Less than 5	0%																	
5	50%																	
6	60%																	
7	70%																	
8	80%																	
9	90%																	
10 and over	100%																	

Survivor Annuity Death Benefit	
Eligibility	Qualified married participant with ten years of credited service
Form	Monthly annuity payable to spouse, deferred to participant's earliest retirement date if later than the date of death
Amount	If death occurs, the amount paid to the surviving spouse is equal to the amount that would have been paid had the participant terminated employment on the date of death and survived to his/her earliest retirement age, retired with a qualified joint and 50% survivor annuity in effect, then died the next day

Lump Sum Death Benefit		
Eligibility	Not eligible for the Survivor Annuity Death Benefit described above	
Form	Lump sum payment to beneficiary	
Amount	Defined Benefit Option	Thrift Plan Option
	Employee contributions plus credited interest In lieu of any other death benefit, the deceased employees' beneficiary may elect to receive a lump sum payment equal to that which the employee would have received under the Termination Benefit described above	Vested account balance

Contributions		
	Defined Benefit Option	Thrift Plan Option
Union	4.2% of earnings plus 1/2 the excess (if any) of the City's contribution over 6.5% of earnings	1%, 2%, 3%, 4%, or 5% of earnings
Administrative Personnel	5.2% of earnings plus 1/2 the excess (if any) of the City's contribution over 6.5% of earnings	1.0% of earnings will be contributed to the Defined Benefit portion 1%, 2%, 3%, 4%, or 5% of earnings will be contributed to the Thrift Plan portion
Police	8.5% of earnings	N/A

Contributions		
	Defined Benefit Option	Thrift Plan Option
City	Remaining cost of plan	50 cents for each \$1.00 contributed by member. (Applies to Administrative Personnel and Union employees only.)
Interest on Employee Contributions	6.0% per year	In accordance with the terms of the investment contract

Vested Balance and Optional Forms		
	Defined Benefit Option	Thrift Plan Option
Vested Account Balance	The sum of (i) and (ii):	
	i. Employee contributions plus credited interest	
	ii. The account balance attributable to City contributions with credited interest in accordance with the following:	
	<u>Years of Credited Service</u>	<u>Percent of City Share Earned</u>
	Less than 5	0%
	5	50%
	6	60%
	7	70%
8	80%	
9	90%	
10 and over	100%	
Optional Forms of Benefit Payments	The optional forms of benefit payments are:	
	• Monthly annuity payable for life, 10 years certain and life	
	• Monthly annuity payable as a survivorship life annuity with survivorship percentages of 50, 75, or 100	
	• Single sum payment equal to the present value of the vested accrued retirement benefit	

Cost of Living adjustment There is no cost-of-living increase for the July 1, 2016 valuation. Historically, there have been cost-of-living increases given to current retirees. There have been no cost-of-living increases since January 1, 2008.

Definitions

Credited Service

For benefit accrual, an employee will receive Credited Service for each year of continuous service and a fraction of a year of service to the nearest full month, from the date he first enters the plan to the date he terminates or retires, whichever is earlier; provided he made the required contributions to the plan. An employee will not receive credited service during any period for which he is eligible to participate if he does not contribute to the plan.

Earnings

Salary or wage at an employee's basic rate of pay but excluding overtime payments, commissions, bonuses, and any other additional compensation but including longevity pay. After December 31, 2001, 401(a)(17) limits apply. No retroactive \$200,000 limit will apply for service on or after January 1, 2002.

Final Average Earnings

Administrative Personnel and Union Employees

Average annual earnings during the 36 consecutive months of the last 120 months of City employment (or, if shorter, the employee's actual period of employment) which produce the highest average.

Police

Average annual earnings during the final 60 months (or, if shorter, the employee's actual period of employment) of City employment.

Assumptions and Methods

There have been several changes in assumptions and no changes in plan provisions since the last valuation report, which was performed as of July 1, 2015 and projected to July 1, 2016. As a result of an experience study, there were changes to the interest rate, mortality rates, retirement rates, withdrawal rates, and disability rates.

Interest	7.00%
Mortality	The RP-2000 Male and Female Combined Healthy Mortality Tables projected (using Projection Scale AA) to 2016 for males and to 2020 for females, and then further adjusted to ensure sufficient margin for improvement in certain age ranges. The RP-2000 Male and Female Disabled Retiree Mortality Tables projected (using Projection Scale AA) to 2021 for males and to 2017 for females. Each table includes a margin for future improvement in life expectancy.
Asset Method	Gains and losses are spread over five years beginning 4/01/2010. This method is being applied prospectively, so gains and losses prior to 2010 will continue to be smoothed over four years until fully recognized.
Deposit After Plan Year Ends	The Actuarial Value of Assets includes contributions for that fiscal year they were intended even if they were made after the end of the fiscal year.
Actuarially Determined Contribution	Normal cost plus 20-year amortization of unfunded actuarial accrued liability with interest to the end of the plan year.
Retirement Age	Normal Retirement Age as defined in the Plan Provisions.

Upcoming Year Salary Increase

The salary is increased based on a combination of the rates determined from the experience study for plan years 2011-2015 plus increases specific to each employee group. The additional increases are 4.25% at each age for Admin members, 4% at each age for Police members, and 3.75% at each age for Union members (which includes both a cost of living and a step increase). Total annual increases are shown below at sample ages:

Age	Increases*		
	Police	Admin	Union
20	6.00%	6.75%	6.00%
24	11.00%	6.25%	6.00%
25	6.50%	6.25%	6.00%
29	12.50%	6.25%	6.00%
30	4.75%	6.25%	6.00%
35	4.75%	4.75%	6.00%
40	4.75%	4.75%	4.75%
45	4.75%	4.75%	4.75%
50	4.75%	4.75%	4.75%
55	4.75%	4.75%	4.75%

*The Union and Police schedules have step increases that cease after Step 16. Their increases are adjusted by 3% being removed from Police and by 2.75% being removed from Union at the point they are expected to reach the end of their step scales.

Expenses

Deducted from the fund according to expenses in scales in Service Agreement. The Normal Cost includes an estimated expense charge.

Disability

Representative Rates of Disability		
Age	Disability	
	Male	Female
20	N/A	N/A
25	0.02%	0.04%
30	0.06	0.09
35	0.11	0.14
40	0.17	0.19
45	0.30	0.30
50	0.42	0.45
55	0.55	0.57
60	N/A	N/A

Marriage

75% married; husbands are 3 years older than wives

Actuarial Cost Method

Entry Age Normal

**Retiree Cost of
Living Increase
Withdrawal**

No explicit increase is assumed for future years

The rates below represent the service based withdrawal assumptions.

Service	Thrift & DB Plans	Police Plan
0	.170	.200
1	.130	.200
5	.090	.040
10	.040	.010
15	.035	.010
25	.025	.000

Retirees

Assets and liabilities for retirees whose benefits are not guaranteed by the Principal Insurance Company contract are included in the valuation.

Description of Actuarial Cost Method: Entry Age Normal

Cost Methods

A cost method is a budgeting tool. It helps to ensure that your pension plan is adequately and systematically funded. Cost methods differ based on how they assign an annual cost to the current year and how they treat gains and losses.

Normal Cost

The portion of cost assigned to each year is called the normal cost. The normal cost may be shared by the employer and the employees based on plan provisions.

Entry Age Normal

The entry age normal cost method is used for valuation. This method estimates the total cost of all projected plan benefits based on the assumptions shown in this report and participant data you have supplied.

Costs are spread evenly from a member's date of hire to assumed retirement age. This annual cost spread as level percentage of compensation if benefits are salary related or as a level dollar amount if not salary related. The sum of each member's annual cost is the normal cost.

There are some accumulated costs for past years. The value of these past costs is the actuarial accrued liability (AAL). Each year the unfunded actuarial accrued liability (UAAL) is the AAL less the actuarial value of assets, but not less than zero. The UAAL is adjusted when there are plan or assumption changes (a liability base is created).

Actuarial Gains/Losses

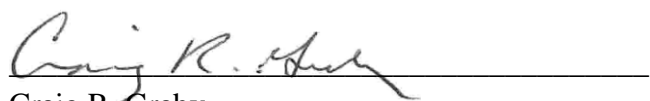
An actuarial gain or loss occurs when actuarial plan experience differs from what was assumed. The actuarial gain or loss is calculated separately but the total UAAL is amortized over 20 years each year in accordance with the City's funding policy.

Actuarial Certification

To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which are reasonable (taking into account past experience under the Plan and reasonable expectations) and which in combination represent our best estimate of anticipated experience under the plan.

The results shown in this report are reasonable actuarial results. However, a different set of results could also be considered reasonable actuarial results. The reason for this is that actuarial standards of practice describe a "best-estimate range" for each assumption, rather than a single best-estimate value. Thus, reasonable results differing from those presented in this report could have been developed by selecting different points within the best-estimate ranges for various assumptions.

The actuary certifying to this valuation is a member of professional actuarial organizations, and meets the General Qualification Standards of the American Academy of Actuaries for purposes of issuing Statements of Actuarial Opinion.

A handwritten signature in black ink, reading "Craig R. Graby", is positioned above a horizontal line.

Craig R. Graby
Member of the American Academy of Actuaries
Fellow of the Conference of Consulting Actuaries
Enrolled Actuary No. 14-7319

Hay Group
March 13, 2017

Estimated cost of 1% Cost of Living increase to current retirees

	07/01/2017 Valuation	07/01/2017 with 1% Cost of Living
Administrative and Union Group		
Accrued Liability		
Participants in pay status	\$42,598,239	\$43,024,221
Inactive participants	5,496,506	5,496,506
<u>Active participants</u>	<u>48,028,831</u>	<u>48,028,831</u>
Total	\$96,123,576	\$96,549,558
Change in Accrued Liability		\$425,982

Each 1% cost of living increase results in an additional \$425,982 of Accrued Liability for the Administrative and Union group.

	07/01/2017 Valuation	07/01/2017 with 1% Cost of Living
Police Group		
Accrued Liability		
Participants in pay status	\$4,292,778	\$4,335,705
Inactive participants	481,340	481,340
<u>Active participants</u>	<u>15,944,480</u>	<u>15,944,480</u>
Total	\$20,718,598	\$20,761,526
Change in Accrued Liability		\$42,928

Each 1% cost of living increase results in an additional \$42,928 of Accrued Liability for the Police group.

The above does not include the amount necessary to purchase a 1% cost of living increase for retirees at Hartford.

Accounting Information for SGAS 25/27

Carry-forward of Net Pension Obligation	
a) Annual required contribution for 2016 plan year	\$ 3,473,255
b) Interest on net pension obligation	(25,328)
c) Adjustment to annual required contribution	36,941
d) Annual pension cost for 2016 plan year (a+b+c)	3,484,869
e) Actual contributions made*	3,473,255
f) Increase/(decrease) in net pension obligation	11,614
g) 2016 beginning of year net pension obligation	(337,700)
h) 2016 end of year net pension obligation	(326,086)
<i>*Assumes contribution equals FY 2016 ARC; if the contribution is a different amount, this table will need to be modified</i>	
Annual Pension Cost for 2017 Plan Year	
a) Normal cost with interest	1,503,017
b) Amortization with interest	2,396,575
c) Annual required contribution (a+b, not less than zero)	3,899,592
d) Interest on net pension obligation	(23,639)
e) Adjustment to annual required contribution	37,078
f) Annual pension cost (c+d+e)	\$ 3,913,031

Development of the Net Pension Obligation (NPO) (Asset)

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Fiscal Year	Valuation Rate	Amortized Period	ARC	Interest On NPO	ARC Adjustment	Amortization Factor	APC (d+e+f)	Actual Deposit	Loss/ (Gain) (d-i)	Change in NOP (h-i)	NPO Balance
2010	7.75%	20	2,511,751	(31,245)	40,302	10.0035	2,520,808	2,511,751	0	9,057	(394,107)
2011	7.75%	20	3,478,242	(30,543)	39,397	10.0035	3,487,096	3,478,242	0	8,854	(385,253)
2012	7.75%	20	3,563,104	(29,857)	38,512	10.0035	3,571,759	3,563,104	0	8,655	(376,599)
2013	7.50%	20	4,255,153	(28,245)	36,941	10.1945	4,263,849	4,255,153	0	8,696	(367,902)
2014	7.50%	19	5,218,589	(27,593)	36,941	9.9591	5,227,938	5,218,589	0	9,349	(358,553)
2015	7.50%	18	4,024,603	(26,892)	36,941	9.7060	4,034,653	4,024,603	0	10,050	(348,504)
2016	7.50%	17	3,575,462	(26,138)	36,941	9.4340	3,586,265	3,575,462	0	10,803	(337,700)
2017	7.50%	16	3,473,255	(25,328)	36,941	9.1415	3,484,869	3,473,255	0	11,614	(326,086)
2018	7.00%	15	3,899,592	(23,639)	37,078	9.1079	3,913,031	TBD	TBD	TBD	TBD

* Assumes contribution equals FY 2015 ARC; if the contribution is a different amount, this table will need to be modified

Schedule of Funding Progress

	(a)	(b)	(a-b)	(a/b)	(c)	(a-b)/c
Actuarial Valuation Date April 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL) Entry Age	Funded (Unfunded) AAL	Funded Ratio	Covered Payroll	FAAL/ UAAL As a Percentage of Covered Payroll
2010	59,550,874	79,275,687	(19,724,813)	75.1%	33,863,526	-58.2%
2011	60,360,919	79,794,044	(19,433,125)	75.6%	33,384,756	-58.2%
2012	62,039,361	88,577,844	(26,538,483)	70.0%	33,212,310	-79.9%
2013	70,144,539	92,843,559	(22,699,020)	75.6%	34,557,409	-65.7%
July 1, 2014	78,490,190	97,275,430	(18,785,240)	80.7%	34,875,678	-53.9%
July 1, 2015	86,925,136	101,027,990	(14,102,854)	86.0%	35,318,946	-39.9%
July 1, 2016	91,600,681	105,318,300	(13,717,619)	87.0%	34,861,650	-39.3%
July 1, 2017	95,584,743	116,842,174	(21,257,431)	81.8%	34,187,757	-62.2%